# (19) World Intellectual Property Organization International Bureau





(43) International Publication Date 28 October 2004 (28.10.2004)

PCT

# (10) International Publication Number WO 2004/092724 A3

- (51) International Patent Classification<sup>7</sup>: G01N 33/569, C07K 14/16
- (21) International Application Number:

PCT/US2004/011022

- (22) International Filing Date: 8 April 2004 (08.04.2004)
- (25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 60/462,071

11 April 2003 (11.04.2003) US

- (71) Applicant (for all designated States except US): THE GOVERNMENT OF THE UNITED STATES OF AMERICA AS REPRESENTED BY THE SECRETARY, DEPARTMENT OF HEALTH [US/US]; Technology Transfer Office, 4770 Buford Highway (K79), Atlanta, GA 30341 (US).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): KALISH, Marcia, L. [US/US]; 1020 Emory Parc Place, Decatur, GA 30033 (US). NDONGMO, Clement, B. [CM/US]; 3017 Woodland Hills Drive, Apt. 17, Ann Arbor, MI 48108 (US). PAU, Chou-Pong [US/US]; 1142 Vistavia Circle, Decatur, GA 30033 (US). SWITZER, William, H. [US/US]; 5745 Redcoat Run, Stone Mountain, GA 30087 (US). FOLKS, Thomas, M. [US/US]; 3815 Belle Glade Trail, Lithonia, GA 30058 (US).
- (74) Agent: RUPERT, Wayne, W.; Klarquist, Sparkman, LLP, One World Trade Center, Suite 1600, 121 Southwest Salmon Street, Portland, OR 97204 (US).

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

#### Declaration under Rule 4.17:

of inventorship (Rule 4.17(iv)) for US only

#### Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 6 May 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MULTIPLE ANTIGENIC PEPTIDE ASSAY FOR DETECTION OF HIV OR SIV TYPE RETROVIRUSES

(57) Abstract: A method for detecting at least one antibody directed against at least one primate immunodeficiency virus in a biological sample that includes contacting a biological sample with (i) at least one detection multiple antigenic peptide comprising a portion of an immunodominant region of a transmembrane protein of a primate immunodeficiency virus and (ii) at least one differentiation multiple antigenic peptide comprising a portion of a V3-loop of an envelope protein of a primate immunodeficiency virus. Also disclosed is an enzyme immunoassay that includes a first substrate to which are bound at least one of the detection multiple antigenic peptides and a second substrate to which are bound at least one of the differentiation multiple antigenic peptides.



#### INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER IPC 7 G01N33/569 C07K14/16

According to International Patent Classification (IPC) or to both national classification and IPC

#### **B. FIELDS SEARCHED**

 $\begin{array}{ll} \mbox{Minimum documentation searched (classification system followed by classification symbols)} \\ \mbox{IPC 7} & \mbox{G01N} & \mbox{C07K} \end{array}$ 

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, EMBASE, Sequence Search, BIOSIS

Category °	Citation of document, with indication, where appropriate, of t	Relevant to claim No.		
Y	KIM P. ET AL.: "Comparing tar and multiple antigenic peptide antigens to detect antibodies immunoassay." J. IMMUNOL. METH., vol. 257, 1 November 2001 (200 pages 51-54, XP004311936 the whole document	1-40		
Y .	strategy for the detection of discrimination among highly di primate lentiviruses." AIDS RES. HUM. RETROVIRUSES.	rimination among highly divergent ate lentiviruses." RES. HUM. RETROVIRUSES, 17, no. 10, 1 July 2001 (2001-07-01), 3 937-952, XP002309765 I in the application		
		-/	,	
X Furth	ner documents are listed in the continuation of box C.	Patent family members are listed	I in annex.	
<ul> <li>Special categories of cited documents:</li> <li>"A" document defining the general state of the art which is not considered to be of particular relevance</li> <li>"E" earlier document but published on or after the International filling date</li> <li>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</li> <li>"O" document referring to an oral disclosure, use, exhibition or other means</li> <li>"P" document published prior to the international filling date but later than the priority date claimed</li> </ul>		cited to understand the principle or to invention  "X" document of particular relevance; the cannot be considered novel or cannot involve an inventive step when the cannot be considered to involve an idocument of particular relevance; the cannot be considered to involve an idocument is combined with one or not ments, such combination being obvi in the art.	<ul> <li>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</li> <li>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled</li> </ul>	

31/03/2005

Authorized officer

Giry, M

Name and mailing address of the ISA

3 February 2005

European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016

## INTERNATIONAL SEARCH REPORT

C.(Continue	ation) DOCUMENTS CONSIDERED TO BE RELEVANT	PC1/US2004/011022	
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Indiana.	
	more appropriate, or the relevant passages	Relevant to claim No.	
Y	FENOUILLET E. ET AL.: "Early and specific diagnosis of seropositivity to HIVs by an enzyme-linked immunosorbent assay using env-derived synthetic peptides." AIDS, vol. 4, 1990, pages 1137-1140, XP001204330 the whole document	1-40	
Υ	RIBEIRO-RODRIGUES R. ET AL.: "Performance characteristics of a rapid new immunochromatographic test for detection of antibodies to human immunodeficiency virus."  CLIN. DIAGN. LAB. IMMUNOL., vol. 10, no. 2, March 2003 (2003-03), pages 303-307, XP002309766 the whole document	1-40	
Y	ZVELEBIL M.J.J.M. ET AL.: "Predictions of linear T-cell and B-cell epitopes in proteins encoded by HIV-1, HIV-2 and SIVmac and the conservation of these sites between strains." FEBS LETT., vol. 242, no. 1, December 1988 (1988-12), pages 9-21, XP002309767 the whole document	1-40	
4	US 6 509 018 B1 (MAUCLERE P. ET AL.) 21 January 2003 (2003-01-21) the whole document	1-10	
\	US 6 210 903 B1 (DE LEYS R.) 3 April 2001 (2001-04-03) the whole document	1-40	
	NDONGMO C.B. ET AL.: "New multiple antigenic peptide-based enzyme immunoassay for detection of simian immunodeficiency virus infection in nonhuman primates and humans."  J. CLIN. MICROBIOL., vol. 42, no. 11, November 2004 (2004-11), pages 5161-5169, XP009041506 the whole document	1-40	

## INTERNATIONAL SEARCH REPORT



			1017032	PC1/US2UU4/U11U22	
Patent document cited in search report	Publication date		Patent family member(s)	Publication date	
US 6509018 B1	21-01-2003	FR	2756843 A1	12-06-1998	
		AU	737857 B2	30-08-2001	
		AU	5327298 A	03-07-1998	
		BR	9713891 A	29-02-2000	
		CA	2274490 A1	18-06-1998	
		CN	1244896 A	16-02-2000	
		ΕP	0946731 A1	06-10-1999	
		WO	9826075 A1	18-06-1998	
		JP	2000515768 T	28-11-2000	
		US	2003157660 A1	21-08-2003	
US 6210903 B1	03-04-2001	AT	179716 T	15-05-1999	
		AU	671623 B2	05-09-1996	
		ΑU	3746393 A	05-10-1993	
		BR	9305435 A	27-12-1994	
		CA	2102301 A1	07-09-1993	
		DE	69324751 D1	10-06-1999	
		DK	589004 T3	15-11-1999	
		MO	9318054 A2	16-09-1993	
		EP	0589004 A1	30-03-1994	
		EP	0891982 A2	20-01-1999	
		ES	2133392 T3	16-09-1999	
		GR	3030595 T3	29-10-1999	
		JP	3443809 B2	08-09-2003	
		JP	6505806 T	30-06-1994	
		JP	2004002379 A	08-01-2004	
		KR KR	257941 B1	01-06-2000	
		NZ	259223 B1	15-06-2000	
		NZ	249838 A 299048 A	28-10-1996	
		US	. 5891640 A	24-09-1998	
		US	6709828 B1	06-04-1999	
		US	6165730 A	23-03-2004 26-12-2000	
		US	6649735 B1	18-11-2003	